

What is claimed is:

1. Blanks for halftone phase shifting photomask having each having a halftone phase shifting film containing at least chromium and fluorine on a transparent substrate, characterized in that the halftone phase shifting film is heat-treated at a temperature between 250 and 500 so that a change of the optical property of the film produced by the application of excimer laser for exposure to the film is decreased.

2. Blanks for halftone phase shifting photomask having each having a halftone phase shifting film containing at least chromium and fluorine on a transparent substrate, characterized in that the halftone phase shifting film is heat-treated at a temperature between 250 and 500 , and that the heat-treated surface of film is removed by etching the surface so that a change of the optical property of the film produced by the application of excimer laser for exposure to the film is decreased and the transmittance is increased.

3. Blanks for halftone phase shifting photomask having each having a halftone phase shifting film containing at least chromium and fluorine on a transparent substrate, characterized in that the halftone phase shifting film is heat-treated at a temperature between 250 and 500 , and that the heat-treated surface of film is removed by etching the surface and thereafter a protective film is provided on the halftone phase shifting film so that a change of the optical property of the film produced by the application of

excimer laser for exposure to the film is decreased and the transmittance is increased.

4. Blanks for halftone phase shifting photomask having each having a halftone phase shifting film containing at least chromium and fluorine on a transparent substrate, characterized in that a protective film is provided on the halftone phase shifting film, that thereafter the halftone phase shifting film having the protective film is heat-treated at a temperature between 250 and 500, and that thereafter the surface of film is removed by etching the surface so that a change of the optical property of the film produced by the application of excimer laser for exposure to the film is decreased.

5. Blanks for halftone phase shifting photomask having each having a halftone phase shifting film containing at least chromium and fluorine on a transparent substrate, characterized in that a protective film is provided on the halftone phase shifting film, and that thereafter the halftone phase shifting film having the protective film is heat-treated at a temperature between 250 and 500 so that a change of the optical property of the film produced by the application of excimer laser for exposure to the film is decreased, and the transmittance is increased.

6. Blanks for halftone phase shifting photomask having each having a halftone phase shifting film containing at least chromium and fluorine on a transparent substrate as claimed in

any of claims 1 to 5, wherein the heat-treated surface of film contains at least chromium and the amount of fluorine contained in the surface is lesser than that contained in the inside of film.

7. Blanks for halftone phase shifting photomask having each having a halftone phase shifting film containing at least chromium and fluorine on a transparent substrate as claimed in any of claims 3 to 5, wherein the protective film contains at least chromium and the amount of fluorine contained in the protective film is lesser than contained in the halftone phase shifting film.

8. Blanks for halftone phase shifting photomask having each having a halftone phase shifting film containing at least chromium and fluorine on a transparent substrate as claimed in any of claims 1 to 5, wherein the interface existing in the inside disappears through the heat-treatment.

9. Halftone phase shifting photomask produced by using blanks for halftone phase shifting photomask as claimed any of claims 1 to 8, characterized in that the halftone phase shifting film is formed into a pattern, after the above-mentioned treatment has been made.

10. Halftone phase shifting photomask having halftone phase shifting film containing at least chromium and fluorine on a transparent substrate, characterized in that the halftone phase shifting film is heat-treated at a temperature between

250 and 500, that the heat-treated halftone phase shifting film is formed into a pattern, and that a protective film is formed on the formed halftone phase shifting film, so that a change of the optical property produced by the application of excimer laser for exposure to the halftone phase shifting film is decreased.

11. Halftone phase shifting photomask having halftone phase shifting film containing at least chromium and fluorine on a transparent substrate, characterized in that the halftone phase shifting film is heat-treated at a temperature between 250 and 500, that the surface of the heat-treated halftone phase shifting film is removed by etching the surface, that the halftone phase shifting film is then formed into a pattern and that a protective film is formed on the formed halftone phase shifting film, so that a change of the optical property produced by the application of excimer laser for exposure to the halftone phase shifting film is decreased and the transmittance of the halftone phase shifting film is increased.

12. Halftone phase shifting photomask having halftone phase shifting film containing at least chromium and fluorine on a transparent substrate, characterized in that the halftone phase shifting film is then formed into a pattern through pattern exposure and that thereafter, the halftone phase shifting film is heat-treated at a temperature between 250 and 500, so that a change of the optical property of the

halftone phase shifting film produced by the application of excimer laser for exposure to the film is decreased.

13. Halftone phase shifting photomask having halftone phase shifting film containing at least chromium and fluorine on a transparent substrate, characterized in that the halftone phase shifting film is formed into a pattern through pattern exposure. the surface of the halftone phase shifting film is heat-treated at a temperature between 250 and 500 and that the surface of the heat-treated film is removed by etching the surface so that a change of the optical property of the halftone phase shifting film caused by excimer laser for exposure applied to the film is decreased.

14. Halftone phase shifting photomask having halftone phase shifting film containing at least chromium and fluorine on a transparent substrate, characterized in that the halftone phase shifting film is formed into a pattern through pattern exposure, that the surface of the halftone phase shifting film is heat-treated at a temperature between 250 and 500 , that the surface of the heat-treated film is removed by etching the surface and that a protective film is then formed on the halftone phase shifting film so that a change of the optical property produced by excimer laser for exposure applied to the film is decreased and the transmittance of the halftone phase shifting film is increased.

15. Halftone phase shifting photomask as claimed in any of claims 10, 11, 14 characterized in that the protective film

contains at least chromium, the amount of fluorine contained in the protective film is lesser than that contained in the halftone phase shifting film.

16. Halftone phase shifting photomask as claimed in any of claims 10, 11, 14 characterized in that the protective film is a transparent film.

17. Halftone phase shifting photomask as claimed in any of claims 10 to 14 characterized in that the interface existing in the inside of the halftone phase shifting film disappears.

18. Halftone phase shifting photomask as claimed in any of claims 10, 11, 14 to 16 characterized in that a pattern size is made lesser than that of objected size, when the halftone phase shifting film is formed into a pattern through pattern exposure.

19. A method of forming a pattern characterized in that halftone phase shifting photomask as claimed in any of claims 9 to 18 is used.